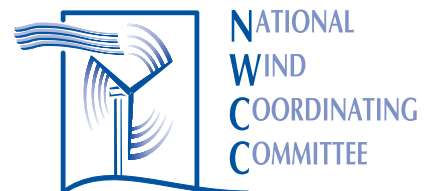


Permitting of Wind Energy Facilities

A HANDBOOK



Prepared by the NWCC Siting Subcommittee
March 1998



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Preface

This handbook was developed by the Siting Subcommittee of the National Wind Coordinating Committee (NWCC). The NWCC was formed in 1994 as a collaborative endeavor composed of representatives from diverse sectors including electric utilities and their support organizations, state utility commissions, state legislatures, consumer advocates, wind equipment suppliers and developers, green power marketers, environmental organizations, and state and federal agencies. The NWCC identifies issues that affect the use of wind power, establishes dialogue among key stakeholders, and catalyzes appropriate activities to support the development of an environmentally, economically and politically sustainable commercial market for wind power.

The NWCC Siting Subcommittee was formed to address wind generation siting and permitting issues. In preparing the handbook, members of the Subcommittee drew from their own experiences in developing and permitting wind projects, reviewed materials used for permitting wind projects at the federal, state and local level, and interviewed over two dozen individuals (listed in Appendix D) who have been involved in some aspect of wind project permitting. Together, these sources form the basis for the information, tools, and insights contained in the handbook.

In addition to this handbook, the National Wind Coordinating Committee will be posting and linking to additional permitting-related materials on its web site: www.nationalwind.org. The NWCC also has a series of Wind Energy Issue Papers and Briefs and is developing other resources on wind generation and related siting considerations. For comments on this handbook or questions on wind energy permitting, contact the National Wind Coordinating Committee Outreach Coordinator c/o RESOLVE, 1255 23rd Street NW, Suite 275, Washington, DC 20037; phone (888) 764-WIND, (202) 944-2300; fax (202) 338-1264; e-mail nwcc@resolve.org.

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Chapter 1

Executive Summary

INTRODUCTION

The power of the wind was first used to generate electricity nearly 100 years ago. Today, wind turbines in the United States play an increasingly important (though still small) role in meeting our electricity needs. They currently produce over three billion kilowatt-hours of electricity annually—enough to meet the needs of over one million people. Commercial wind energy projects have been permitted in several states including California, Minnesota, Hawaii, Texas, Massachusetts, Vermont, and Maine. Given wind energy's environmental benefits, coupled with dramatic equipment cost reductions¹ and reliability improvements over the last 20 years, it is anticipated that more wind projects will be proposed to decision-makers and communities throughout the United States.

Why Wind Energy?

The production of energy is one of the most far-reaching of human activities in terms of its environmental impacts. Wind energy and other renewable energy sources, such as solar and geothermal energy, offer the prospect of producing large amounts of electricity with greatly reduced effects on the environment:

- There is growing agreement in the scientific community that air pollution, part of which comes from fossil-fueled power plants, poses a serious health risk. Whereas a 100-megawatt natural gas-fired power plant may emit 75-100 tons each of nitrogen and sulfur oxides per year, wind facilities emit no air pollutants.
- The scientific community also sees the worldwide buildup of carbon dioxide from the combustion of fossil fuels and other "greenhouse gases" in the atmosphere as a likely contributor to global climate change. Unlike fossil-fueled power plants, wind facilities emit no greenhouse gases.

Making Use of this Handbook

This handbook has been written for individuals and groups involved in evaluating wind projects: decision-makers and agency staff at all levels of government, wind developers, interested parties and the public. Its purpose is to help stakeholders make permitting decisions in a manner which assures necessary environmental protection and responds to public needs. Such timely and defensible

decisions are less likely to be challenged in court, and will allow wind to be a competitive electrical generation resource.

Some decision-makers already have energy facility permitting processes but may not be familiar with wind generation technologies and approaches to resolving wind permitting issues. Other decision-makers may not have dealt with any energy facilities. Because this handbook was designed to benefit decision-makers and others with varying degrees of experience in facility siting, different readers may make use of all or only portions of the Handbook's three main sections:

Chapter 2—Overview of Wind Development and Permitting describes the basic features of a wind project and walks the reader through the basic steps in planning, permitting, construction, operation and closure of a wind facility.

Chapter 3—Guidelines for Structuring the Wind Facility Permitting Process presents principles, processes and concepts that agencies, developers and the public may want to employ in the consideration and oversight of proposed wind projects.

Chapter 4—Specific Permitting Considerations and Strategies discusses the tradeoffs to be considered in weighing the environmental and other issues that may arise in permitting wind facilities at various locations, and provides suggestions on how to deal with those issues.

In addition to the above sections, there are appendices to the handbook which refer the reader to additional resources and which give examples of tools and techniques (e.g., wording from local ordinances) that have been applied in some permitting situations and may have application in others.

Because permitting issues and processes will vary according to location and individual wind project, regulatory agencies are encouraged to apply those parts of this Handbook that most directly meet their needs. Not all the information or process recommendations will be applicable in every situation.

¹Wind generation today is in a competitive range, although still slightly more expensive than most new fossil-fueled power plants.

SUMMARY OF KEY POINTS

Distinguishing Features of Wind Energy Facilities

Some aspects of wind facility permitting closely resemble permitting considerations for any other large energy facility or other development project. Others are unique to wind generation facilities. Unlike most energy facilities, wind generation facilities tend to be located in rural or remote areas, and are land-intrusive rather than land-intensive. Thus they may extend over a very large area and have a broad area of influence, but physically occupy only three to five percent of this acreage for the turbine towers and associated structures and access roads. The rest of the acreage may be left largely undisturbed and available for other compatible purposes. Chapter 2 describes the major components of a wind project: wind turbines, anemometers, electrical power collection and the transmission system, control and maintenance facilities, and site access and service roads—some or all of which may be present in a given project. It also provides an overview of the major steps in wind project development: planning, financing, permitting, construction, operation, and decommissioning.

Structuring the Wind Facility Permitting Process

As with other energy facilities, the goal of a wind facility permitting process is to reach decisions that are timely and avoid unnecessary court challenge; ensure project compliance with existing laws and regulations providing for necessary environmental protection at a reasonable cost; and allow wind to be a competitive electrical generation resource. Chapter 3 briefly describes the typical steps in permitting a wind facility: preapplication, application review, decision-making, administrative and judicial review, and permit compliance. The chapter then discusses the following eight guidelines for structuring a permitting process to allow for efficient agency review, meaningful public involvement, and timely and defensible decisions:

- 1) **Significant Public Involvement.** Providing opportunities for early, significant, and meaningful public involvement is crucial to a successful process, but there is no one simple formula for achieving this.
- 2) **Issue-Oriented Process.** Understanding the

most important issues in each wind project and focusing the permitting process on resolving them helps make for timely decisions and a smaller likelihood of litigation.

- 3) **Clear Decision Criteria.** Decision-making criteria should be clear and consistently applied, and made known from the outset to all participants and interested parties.
- 4) **Coordinated Permitting Process.** Where more than one agency has jurisdiction over permitting, agencies are encouraged to coordinate so that project review can proceed simultaneously and that redundant, conflicting or inconsistent requirements, standards and processes can be avoided.
- 5) **Reasonable Time Frames.** Unnecessary delays and associated uncertainties can be minimized if permitting agencies specify reasonable time frames for each of the major phases of the permitting process, and manage the process to stay within those time frames.
- 6) **Advance Planning.** Both developers and agencies should know as much as possible about the project, the process, the participants, and the issues prior to commencing the formal permitting process.
- 7) **Efficient Administrative and Judicial Review.** Following established procedures designed to systematically narrow the issues of concern and produce factually-based decisions can significantly limit appeals and allow them to proceed more efficiently if they do occur.
- 8) **Active Compliance Monitoring.** Most agencies include in their permits specific conditions that must be met during construction, operation, and project closure; these conditions can best be implemented if they are: specific, measurable, agreed upon by all parties, realistic, set within reasonable time frames, enforceable, and actually enforced.

Specific Permitting Considerations and Strategies

Whether a wind project consists of a large wind farm or a single turbine, a range of considerations

may be raised before, during or after project development. Siting decisions inevitably require balancing the various impacts and making tradeoffs among them. Permitting agencies also need to consider cost-benefit tradeoffs associated with impact mitigation strategies. The permitting process seeks to strike a balance between making a project acceptable to the community and preserving the project's economic viability in a competitive electricity market. The following wind facility siting considerations are discussed in Chapter 4 along with strategies and "tips" for addressing them within the context of the permitting process. All parties need to recognize that the applicability of these considerations will depend on the specific wind project proposal and site conditions. Not every consideration will apply to each wind project.

- **Land Use.** Depending on the site, size and design of the project, wind development may be compatible with a variety of other land uses, including agriculture, grazing, open space and habitat preservation. Other land uses and resource values need to be considered when siting large wind projects in remote areas. Stakeholders need to understand the full range of land use issues associated with a site before getting locked into development plans, permit conditions, or other requirements.
- **Noise.** Because noise emitted by wind turbines tends to be masked by the ambient (background) noise of the wind itself and falls off sharply with distance, noise-related concerns are likely to center on residences closest to the site, particularly those sheltered from prevailing winds. Advanced turbine technology and preventive maintenance can help minimize noise during project operation.
- **Birds and Other Biological Resources.** The potential for collisions between birds and wind energy facilities has been a controversial siting consideration. Biological resource surveys can help to determine whether or not serious conflicts are likely to occur. In many cases, impact on birds and other sensitive biological resources can be adequately mitigated; if not, wind development may not be appropriate in a particular location.
- **Visual Resources.** There are a number of ways to reduce the visual impact of wind projects, but there may be tradeoffs to consider. One of

the best tools for assessing project impact is the use of visual simulations.

- **Soil Erosion and Water Quality.** Wind projects entail both temporary and permanent soil disturbance, and some care must be taken to estimate and control both runoff and erosion from the site, particularly where access roads and facilities are located in steep terrain.
- **Public Health and Safety.** Most of the safety issues associated with wind energy projects can be dealt with through adequate setbacks, security, safe work practices, and the implementation of a fire control plan.
- **Cultural and Paleontological Resources.** During project design and site development, important cultural and fossil resource sites should be avoided and protected, or a mitigation plan developed. Special care may need to be taken to preserve the confidentiality as well as the integrity of certain sensitive resources, or sites sacred to Native Americans.
- **Socioeconomic/Public Services/Infrastructure.** Developers and permitting agencies should coordinate with local public service agencies to determine how the project may affect the community's fire protection and transportation systems, and nearby airports and communications systems. Communities should work with wind project developers to ensure that any financial burden placed on them will be compensated through appropriate/reasonable property tax or other revenues.
- **Solid and Hazardous Wastes.** Solid wastes need to be collected from dispersed sites and properly disposed of; non-hazardous fluids should be used where possible, and a Hazardous Materials Waste Plan drawn up if their use cannot be avoided. Problems can be avoided by performing major maintenance and repair work off-site.
- **Air Quality and Climate.** Wind projects produce energy without generating many of the pollutants associated with fuel combustion. Temporary, local emissions associated with project construction and maintenance can be minimized, and any micro-climatic impacts should be insignificant.